

Claims

- [c1] 1. A belt tension adjustment apparatus for providing a proper tension in a transmission belt inside a station, wherein the station at least includes a main body casing, a pair of belt wheels and a transmission system, the belt wheels, the transmission system and the transmission belt are all enclosed inside the main body casing, the transmission belt is wrapped around the belt wheels, the transmission system is coupled to one of the belt wheels, and the belt tension adjustment apparatus includes a plate spring having a bow in the middle with ends gripping the transmission belt such that a section of the transmission belt forms a bend to provide a proper tension in the belt.
- [c2] 2. The belt tension adjustment apparatus of claim 1, wherein the plate spring deforms elastically between a first configuration with the plate spring fully opened and a second configuration with the plate spring fully closed, and the plate spring is in a third configuration intermediate between the first configuration and the second configuration when the plate spring is mounted on the transmission belt.
- [c3] 3. The belt tension adjustment apparatus of claim 1, wherein the plate spring further includes a gripping structure at each end of the plate spring for gripping the transmission belt.
- [c4] 4. The belt tension adjustment apparatus of claim 1, wherein the apparatus further includes a tension spring whose ends are connected to the ends of the plate spring.
- [c5] 5. The belt tension adjustment apparatus of claim 4, wherein the tension spring is a helical tension spring.
- [c6] 6. The belt tension adjustment apparatus of claim 4, wherein the plate spring further includes a latching groove structure at each end of the plate spring and a latching hook at each end of the tension spring, and the latching hooks at the end of the tension spring are engaged to the latching groove structures at the end of the plate spring.
- [c7] 7. The belt tension adjustment apparatus of claim 1, wherein the transmission

system further includes an electric motor and a gearset, the motor couples with the gearset and the gearset is coupled to one of the belt wheels so that the motor is able to drive one of the belt wheels.

- [c8] 8. The belt tension adjustment apparatus of claim 1, wherein the transmission belt includes a belt with internal teeth.
- [c9] 9. A belt tension adjustment apparatus for an optical scanner, wherein the optical scanner includes at least a main body casing, a scanning module, a transmission system, a pair of belt wheels and a transmission belt, the main body casing has a transparent platform thereon, the scanning module is capable of reciprocating forward and backward inside the main body casing underneath the transparent platform to scan a document placed over the transparent platform, the transmission system, the transmission belt and the belt wheels are all enclosed inside the main body casing, and the transmission system is coupled to one of the belt wheels for driving the transmission belt and hence moving the scanning module that attaches to the belt, comprising: a plate spring having a bow in the middle with ends gripping the transmission belt so that a section of the transmission belt bends to provide a tension in the belt; and a tension spring whose ends are engaged to the respective end of the plate spring.
- [c10] 10. The belt tension adjustment apparatus of claim 9, wherein the plate spring deforms elastically between a first configuration with the plate spring fully opened and a second configuration with the plate spring fully closed, and the plate spring is in a third configuration intermediate between the first configuration and the second configuration when the plate spring is mounted on the transmission belt.
- [c11] 11. The belt tension adjustment apparatus of claim 9, wherein the plate spring further includes a gripping structure at each end of the plate spring for gripping the transmission belt.
- [c12] 12. The belt tension adjustment apparatus of claim 9, wherein the plate spring further includes a latching groove structure at each end of the plate spring and

a latching hook at each end of the tension spring, and the latching hooks at the end of the tension spring are engaged to the latching groove structures at the end of the plate spring.

- [c13] 13. The belt tension adjustment apparatus of claim 9, wherein the transmission system further includes an electric motor and a gearset, the motor couples with the gearset and the gearset is coupled to one of the belt wheels so that the motor is able to drive one of the belt wheels.
- [c14] 14. The belt tension adjustment apparatus of claim 9, wherein the transmission belt includes a belt with internal teeth.
- [c15] 15. An optical scanner, comprising:a main body casing having a transparent platform thereon;a pair of belt wheels inside the main body casing; a transmission belt inside the main body casing and wrapped around the belt wheels; a scanning module capable of reciprocating forward and backward inside the main body casing underneath the transparent platform, wherein the scanning module is attached to the transmission belt and hence is driven by the belt; a transmission system inside the main body casing and coupled with one of the belt wheels for driving the belt wheel; and a tension adjustment apparatus mounted on the transmission belt for adjusting tension in the belt.
- [c16] 16. The optical scanner of claim 15, wherein the tension adjustment apparatus further includes a plate spring having a bow in the middle with ends gripping the transmission belt so that a section of the belt bends to produce a tension in the belt.
- [c17] 17. The optical scanner of claim 15, wherein the tension adjustment apparatus further includes a tension spring whose ends engage with the respective end of the plate spring.
- [c18] 18. The optical scanner of claim 17, wherein the tension spring is a helical tension spring.
- [c19] 19. The optical scanner of claim 15, wherein the transmission system further includes an electric motor and a gearset, the motor couples with the gearset

and the gearset is coupled to one of the belt wheels so that the motor is able to drive one of the belt wheels.

- [c20] 20. The optical scanner of claim 15, wherein the transmission belt includes a belt with internal teeth.